

**UNITED STATES DEPARTMENT OF COMMERCE****United States Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

1.2

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/393,043	09/09/99	LUO	W 08935/151001

ROBERT C. NABINGER
FISH & RICHARDSON P.C.
225 FRANKLIN STREET
BOSTON MA 02110-2804

IM52/0622

EXAMINER

CREPEAU, J

ART UNIT

PAPER NUMBER

1745

10

DATE MAILED: 06/22/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/393,043

Applicant(s)

LUO ET AL.

Examiner

Jonathan S. Crepeau

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 September 1999.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,6,7,9.

- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-46 and 51-54 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The instant claims all recite the quantity " $(S/V)^2$ ", where S is the separator surface area and V is the volume of the cathode (page 2, specification). However, no units are specified for the results of this quantity, thereby rendering these results indeterminate in scope. Based on the example on page 12 of the specification, the correct unit should be " mm^{-2} ". Correction is required.

Claims 51 and 53 recite the limitation "the second cavity" in lines 7 and 5, respectively. There is insufficient antecedent basis for this limitation in the claims.

Claims 51-54 additionally recite the limitations "above Plot A" and "above Plot B" in reference to Figure 8 of the application. These recitations are considered to be indefinite, since where possible, claims must be complete unto themselves. Reference to drawings, photographs, tables, etc. is permitted only when there is no other practical way to define the invention. It is a doctrine of necessity, not convenience. *Ex parte Gring* 158 USPQ 109; *Ex parte Maya* 156 USPQ 428; *In re Faust* 86 USPQ 114. Accordingly, these claims have been rejected under 35 USC §103 below, as best they are understood.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-39 and 47-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 7-326370.

In Figure 4, the reference teaches a primary alkaline battery comprising a cylindrical housing (4), a single-cavity eight-lobed anode (6), a cathode (3) surrounding the anode, and a separator (2) between the anode and cathode. As disclosed in paragraph [0005], the anode comprises zinc, and the cathode comprises manganese dioxide.

The reference does not explicitly teach the $(S/V)^2$ values of the battery, that the battery can be in AAAA, AAA, AA, C, and D sizes, or that the anode comprises nine lobes.

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of the reference to increase the surface area of the separator, while keeping the cathode volume constant, so as to produce an $(S/V)^2$ value within the claimed ranges. In paragraphs [0003] and [0005], the reference teaches that by adjusting the shape of the separator, a space is created between the separator and cathode, thereby allowing the battery to retain a larger volume of electrolyte. As a result, the active material is more efficiently used, and the polarization is improved. In Figure 4, the separator is of a "wavy" shape, which results in an

anode having eight lobes. However, the reference does not specifically limit this embodiment to eight lobes, and it would be within the skill of the art to use a separator/anode configuration that resulted in more lobes, depending on the “waviness” of the separator. In any event, the reference provides clear motivation to increase the surface area of the separator (“S”) in comparison to a conventional cylindrical separator. Accordingly, while the ranges of $(S/V)^2$ recited in the instant claims would not necessarily be inherent in the batteries of the reference, the artisan would have sufficient motivation to use large surface area separators that would result in $(S/V)^2$ values falling within these ranges. Accordingly, these ranges are not considered to distinguish over the reference.

Regarding the sizes of the battery (i.e., that they can be in AAAA, AAA, AA, C, and D sizes), paragraph [0003] of the reference describes the battery as “conventional.” Therefore, the artisan may surmise that the battery contemplated by the reference may come in any of these conventional sizes. In addition, the courts have held that changes in size are generally not sufficient to patentably distinguish over the prior art (*see* MPEP §2144.04 (IV) (A)).

5. Claims 1-33, 40-46, 53, and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mick (U.S. Patent 5,869,205).

In Figures 5 and 6, the reference teaches a primary alkaline battery comprising a cylindrical housing (12), two D-shaped anode cavities (46A, 46B), a cathode (40) surrounding

anodes, and separators (44A, 44B). As disclosed in column 3, line 28 and in column 4, line 40, the anode comprises zinc, and the cathode comprises manganese dioxide.

The reference does not explicitly teach the $(S/V)^2$ values of the battery, that the battery can be in AAAA, AAA, AA, C, and D sizes, that “connections” do or do not exist between the D-shaped anode cavities, or that the cavities may be pie-shaped.

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of the reference to increase the surface area of the separator so as to produce an $(S/V)^2$ value within the claimed ranges. In column 5, lines 29-37, the reference teaches that an increase in anode-to-cathode interface area advantageously increases the service performance, particularly for high-rate cells. Therefore, the reference provides clear motivation to increase the surface area of the separator (“S”). Accordingly, while the ranges of $(S/V)^2$ recited in the instant claims would not necessarily be inherent in the batteries of the reference, the artisan would have sufficient motivation to use large surface area separators that would result in $(S/V)^2$ values falling within these ranges. Accordingly, these ranges are not considered to distinguish over the reference.

Regarding the size of the battery, it is noted that the passage at column 1, lines 11-15 of the reference specifically discloses that AAAA, AAA, AA, C, and D sizes are commercially available. Therefore, the artisan may surmise that the battery contemplated by the reference may come in any of these conventional sizes. In addition, the courts have held that changes in size

are generally not sufficient to patentably distinguish over the prior art (*see* MPEP §2144.04 (IV) (A)).

Regarding the limitation that a “connection” exists between the two D-shaped cavities, the artisan may ascertain that an electrical connection exists through current collector 48. Similarly, regarding the limitation that a connection does *not* exist between the two D-shaped cavities, it is evident from Figure 5 that a *physical* connection (i.e., a contiguous piece of active material) between the two cavities does not exist. Accordingly, these limitations are not considered to distinguish over the reference.

Regarding the limitation that the anode cavities include up to four pie-shaped cavities, this limitation is also not considered to distinguish over the reference. As shown in Figures 2 and 3, the reference contemplates an embodiment where the anode comprises four *circular* cavities. However, the courts have held that changes in shape are generally not sufficient to patentably distinguish over the prior art (*see* MPEP §2144.04 (IV) (B)). Additionally, as stated above, the reference provides motivation to increase the area of the separators, and changing the shape of the anode cavities is seen as an obvious way of doing this. Accordingly, this limitation is not considered to distinguish over the reference.

Conclusion


6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gabrielle Brouillette, can be reached at (703) 308-0756. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900. Additionally, documents may be faxed to (703) 305-3599.

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

JSC

June 20, 2001


STEPHEN KALAFUT
PRIMARY EXAMINER
GROUP
1700